ISIP018US

CLAIMS AMENDMENTS

Please amend claim 45 as shown below. All other claims remain unchanged.

1. (Original) An optical pickup apparatus comprising:

an electronically reconfigurable diffraction grating modulating relative light intensities of at least two different diffraction orders of light diffracted by said electronically reconfigurable diffraction grating;

delivery and focusing optics for focusing said light diffracted by said electronically reconfigurable diffraction grating into diffractive spots corresponding with each of said diffraction orders and delivering said directed light onto an optical storage medium, which light is then reflected by said optical storage medium; and

a detector for detecting said light reflected by said optical storage medium and striking said detector.

2. (Original) The apparatus of claim 1, wherein:

said diffraction orders comprise two diffraction orders comprising zeroth and first diffraction orders;

said delivery and focusing optics causes said diffractive spots corresponding with said zeroth order to partially overlap with said diffractive spots corresponding with said first order; and

overlapping light from said zeroth and first diffractive orders striking said detector is resolved into its proper orders by examining the modulation of the intensities of said overlapping light in relation to known modulation frequencies of

said zeroth and first diffraction orders by said electronically reconfigurable diffraction grating.

3. (Original) The apparatus of claim 1, wherein:

said diffraction orders comprise more than two diffraction orders, comprising zeroth and first diffraction orders, and at least one additional diffraction order higher than said zeroth and first diffraction orders.

4. (Original) The apparatus of claim 1, wherein:

said diffraction orders comprise more than two diffraction orders, comprising zeroth and first diffraction orders, and at least one additional diffraction order higher than said zeroth and first diffraction orders;

said delivery and focusing optics causes said diffractive spots corresponding with each said diffraction order to partially overlap with said diffractive spots corresponding with at least a diffraction order adjacent thereto; and

overlapping light from said more than two diffractive orders striking said detector is resolved into its proper orders by examining the modulation of intensities of said overlapping light in relation to known modulation frequencies of said more than two diffractive orders by said electronically reconfigurable diffraction grating.

5. (Original) The apparatus of claim 1, wherein:

said diffraction orders comprise more than two diffraction orders, comprising zeroth and first diffraction orders, and at least one additional diffraction order higher than said zeroth and first diffraction orders;

said delivery and focusing optics causes said diffractive spots corresponding with each said diffraction order to partially overlap with said diffractive spots corresponding with at least a diffraction order adjacent thereto; and

overlapping light from said more than two diffractive orders striking said detector is resolved into its proper orders by examining the modulation of intensities and the phase shift of said overlapping light in relation to known modulation frequencies of said more than two diffractive orders by said electronically reconfigurable diffraction grating.

6. (Original) The apparatus of claim 2, wherein:

light from said zeroth order comprises content information from said optical storage medium;

light from said first order comprises tracking information from said optical storage medium.

7. (Original) The apparatus of claim 2, wherein:

light from said zeroth order comprises content information from said optical storage medium;

light from said first order comprises content information from said optical storage medium;

light from said second order comprises tracking information from said optical storage medium.

8. (Original) The apparatus of claim 2, wherein:

light from said zeroth order comprises content information from said optical storage medium;

light from said first order comprises tracking information from said optical storage medium;

light from said second order comprises tracking information from said optical storage medium.

9. (Original) The apparatus of claim 3, wherein:

light from said zeroth order comprises content information from said optical storage medium;

light from said first order comprises content information from said optical storage medium;

light from said second order comprises tracking information from said optical storage medium.

10. (Original) The apparatus of claim 3, wherein:

light from said zeroth order comprises content information from said optical storage medium;

light from said first order comprises tracking information from said optical storage medium;

light from said second order comprises tracking information from said optical storage medium.

11. (Original) The apparatus of claim 4, wherein:

light from said zeroth order comprises information content from said optical storage medium;

light from said first order comprises content information from said optical storage medium;

light from said second order comprises tracking information from said optical storage medium.

12. (Original) The apparatus of claim 4, wherein:

light from said zeroth order comprises content information from said optical storage medium;

light from said first order comprises tracking information

from said optical storage medium;

light from said second order comprises tracking information from said optical storage medium.

13. (Original) The apparatus of claim 1, wherein:

said electronically reconfigurable diffraction grating comprises a reflection grating.

14. (Previously Withdrawn) The apparatus of claim 1, wherein:

said electronically reconfigurable diffraction grating comprises a transmission grating.

15. (Original) The apparatus of claim 1, wherein:

said apparatus reads content and tracking information prerecorded on said optical storage medium.

16. (Original) The apparatus of claim 1, wherein:

said light striking said photodetector is comprised of at least two individual said diffractive orders;

whereby each individual said diffractive order has measuring properties that comprise said intensity, said frequency of intensity modulation, and said phase;

and whereby said photodetector measures said individual diffractive orders by at least one of said measuring property.

17. (Original) The apparatus of claim 2, wherein:

said light striking said photodetector is comprised of; said zero diffractive order with a first set of said measuring properties which comprises a first intensity, a first frequency of intensity modulation, and a first phase; and said first diffractive orders with a second set of said measuring properties which comprises a second intensity, a second frequency of

intensity modulation, a second phase;

whereby said first orders may overlap with said zero order on said detector;

and whereby said zero and first orders may be read simultaneously by said detector and differentiated by said detector by any of their individual said measuring properties.

18. (Original) The apparatus of claim 2, wherein:

said light striking said photodetector is comprised of; said zero diffractive order with a first set of said measuring properties which comprises a first intensity, a first frequency of intensity modulation, and a first phase; said first diffractive orders with a second set of said measuring properties which comprises a second intensity, a second frequency of intensity modulation, a second phase; and said second diffractive orders with a third set of said measuring properties which comprises a third intensity, a third frequency of modulation and a third phase;

whereby said first orders may overlap with said zero order on said detector, and said second orders may overlap with said first orders on said detector;

and whereby said zero, first and second orders may be read simultaneously by said detector and differentiated by said detector by any of their individual said measuring properties.

19. (Original) The apparatus of claim 3, wherein:

said light striking said photodetector is comprised of; said zero diffractive order with a first set of said measuring properties which comprises a first intensity, a first frequency

of intensity modulation, and a first phase; and said first diffractive orders with a second set of said measuring properties which comprises a second intensity, a second frequency of intensity modulation, a second phase;

whereby said first orders may overlap with said zero order on said detector;

and whereby said zero and first orders may be read simultaneously by said detector and differentiated by said detector by any of their individual said measuring properties.

20. (Original) The apparatus of claim 3, wherein:

said light striking said photodetector is comprised of; said zero diffractive order with a first set of said measuring properties which comprises a first intensity, a first frequency of intensity modulation, and a first phase; said first diffractive orders with a second set of said measuring properties which comprises a second intensity, a second frequency of intensity modulation, a second phase; and said second diffractive orders with a third set of said measuring properties which comprises a third intensity, a third frequency of modulation and a third phase;

whereby said first orders may overlap with said zero order on said detector, and said second orders may overlap with said first orders on said detector;

and whereby said zero, first and second orders may be read simultaneously by said detector and differentiated by said detector by any of their individual said measuring properties.

21. (Original) The apparatus of claim 4, wherein:

said light striking said photodetector is comprised of; said zero diffractive order with a first set of said measuring properties which comprises a first intensity, a first frequency of intensity modulation, and a first phase; and said first diffractive orders with a second set of said measuring properties which comprises a second intensity, a second frequency of intensity modulation, a second phase;

whereby said first orders may overlap with said zero order on said detector;

and whereby said zero and first orders may be read simultaneously by said detector and differentiated by said detector by any of their individual said measuring properties.

22. (Original) The apparatus of claim 4, wherein:

said light striking said photodetector is comprised of; said zero diffractive order with a first set of said measuring properties which comprises a first intensity, a first frequency of intensity modulation, and a first phase; said first diffractive orders with a second set of said measuring properties which comprises a second intensity, a second frequency of intensity modulation, a second phase; and said second diffractive orders with a third set of said measuring properties which comprises a third intensity, a third frequency of modulation and a third phase;

whereby said first orders may overlap with said zero order on said detector, and said second orders may overlap with said first orders on said detector;

and whereby said zero, first and second orders may be read

simultaneously by said detector and differentiated by said detector by any of their individual said measuring properties.

23. (Original) A method for reading an optical storage device comprising the steps of:

modulating relative light intensities of at least two different diffraction orders of light diffracted by an electronically reconfigurable diffraction grating;

focusing said light diffracted by said electronically reconfigurable diffraction grating into diffractive spots corresponding with each of said diffraction orders and delivering said directed light onto an optical storage medium, which light is then reflected by said optical storage medium; and

detecting said light reflected by said optical storage medium by a detector.

24. (Original) The method of claim 23, wherein:

said diffraction orders comprise two diffraction orders comprising zeroth and first diffraction orders;

said diffractive spots corresponding with said zeroth order partially overlaps with said diffractive spots corresponding with said first order; and further comprising,

resolving overlapping light from said zeroth and first diffractive orders by said detector into its proper orders by examining the modulation of the intensities of said overlapping light in relation to known modulation frequencies of said zeroth and first diffraction orders by said electronically reconfigurable diffraction grating.

25. (Original) The method of claim 23, wherein:

said diffraction orders comprise more than two diffraction orders, comprising zeroth and first diffraction orders, and at least one additional diffraction order higher than said zeroth and first diffraction orders.

26. (Original) The method of claim 23, wherein:

said diffraction orders comprise more than two diffraction orders, comprising zeroth and first diffraction orders, and at least one additional diffraction order higher than said zeroth and first diffraction orders;

said diffractive spots corresponding with each said diffraction order partially overlap with said diffractive spots corresponding with at least a diffraction order adjacent thereto; and further comprising

resolving overlapping light from said more than two diffractive orders by said detector into its proper orders by examining the modulation of intensities of said overlapping light in relation to known modulation frequencies of said more than two diffractive orders by said electronically reconfigurable diffraction grating.

27. (Original) The method of claim 23, wherein:

said diffraction orders comprise more than two diffraction orders, comprising zeroth and first diffraction orders, and at least one additional diffraction order higher than said zeroth and first diffraction orders;

said delivery and focusing optics causes said diffractive spots corresponding with each said diffraction order to partially overlap with said diffractive spots corresponding with at least a

diffraction order adjacent thereto; and further comprising,

resolving overlapping light from said more than two diffractive orders by said detector into its proper orders by examining the modulation of intensities and the phase shift of said overlapping light in relation to known modulation frequencies of said more than two diffractive orders by said electronically reconfigurable diffraction grating.

28. (Original) The method of claim 24,

said light from said zeroth order comprising content information from said optical storage medium;

said light from said first order comprising tracking information from said optical storage medium.

29. (Original) The method of claim 24,

said light from said zeroth order comprising content information from said optical storage medium;

said light from said first order comprising content information from said optical storage medium

said light from said second order comprising tracking information from said optical storage medium.

30. (Original) The method of claim 24,

said light from said zeroth order comprising content information from said optical storage medium;

said light from said first order comprising tracking information from said optical storage medium.

said light from said second order comprising tracking information from said optical storage medium.

31. (Original) The method of claim 25,

said light from said zeroth order comprising content information from said optical storage medium;

said light from said first order comprising content information from said optical storage medium

said light from said second order comprising tracking information from said optical storage medium.

32. (Original) The method of claim 25,

said light from said zeroth order comprising content information from said optical storage medium;

said light from said first order comprising tracking information from said optical storage medium;

said light from said second order comprising tracking information from said optical storage medium.

33. (Original) The method of claim 26,

said light from said zeroth order comprising information content from said optical storage medium;

said light from said first order comprising content information from said optical storage medium;

said light from said second order comprising tracking information from said optical storage medium.

34. (Original) The method of claim 26,

said light from said zeroth order comprising content information from said optical storage medium;

said light from said first order comprising tracking information from said optical storage medium;

said light from said second order comprising tracking information from said optical storage medium.

35. (Original) The method of claim 23,

said electronically reconfigurable diffraction grating comprising a reflection grating.

36. (Previously Withdrawn) The method of claim 23,

said electronically reconfigurable diffraction grating comprising a transmission grating.

37. (Original) The method of claim 23,

said apparatus reads content and tracking information prerecorded on said optical storage medium.

38. (Original) The method of claim 23,

striking said photodetector with said light further comprising at least two individual said diffractive orders; whereby each individual said diffractive order has measuring properties comprising said intensity, said frequency of intensity modulation, and said phase; and

measuring by said photodetector of said individual diffractive orders by utilizing at least one of said measuring property.

39. (Original) The method of claim 24,

striking said photodetector with said light further comprising;

said zero diffractive order with a first set of said measuring properties comprising a first intensity, a first frequency of intensity modulation, and a first phase; and

said first diffractive orders with a second set of said measuring properties comprising a second intensity, a second frequency of intensity modulation, a second phase;

overlapping of said first orders with said zero order on said detector;

reading simultaneously by said detector said zero and said first diffractive orders and differentiating by said detector utilizing any of their individual said measuring properties.

40. (Original) The method of claim 24,

striking said photodetector with said light further comprising;

said zero diffractive order with a first set of said measuring properties comprising a first intensity, a first frequency of intensity modulation, and a first phase; and

said first diffractive orders with a second set of said measuring properties comprising a second intensity, a second frequency of intensity modulation, a second phase; and

said second diffractive orders with a third set of said measuring properties comprising a third intensity, a third frequency of modulation and a third phase;

overlapping of said first orders with said zero order on said detector, and overlapping of said second orders on said detector;

reading simultaneously by said detector said zero diffractive order, said first diffractive orders and said second diffractive orders, differentiating by said detector utilizing any of their individual said measuring properties.

41. (Original) The method of claim 25,

striking said photodetector with said light further comprising;

said zero diffractive order with a first set of said measuring properties comprising a first intensity, a first frequency of intensity modulation, and a first phase; and

said first diffractive orders with a second set of said measuring properties comprising a second intensity, a second frequency of intensity modulation, a second phase;

overlapping of said first orders with said zero order on said detector;

reading simultaneously by said detector said zero and said first diffractive orders and differentiating by said detector utilizing any of their individual said measuring properties.

42. (Original) The method of claim 25,

striking said photodetector with said light further comprising;

said zero diffractive order with a first set of said measuring properties comprising a first intensity, a first frequency of intensity modulation, and a first phase; and

said first diffractive orders with a second set of said measuring properties comprising a second intensity, a second frequency of intensity modulation, a second phase; and

said second diffractive orders with a third set of said measuring properties comprising a third intensity, a third frequency of modulation and a third phase;

overlapping of said first orders with said zero order on said detector, and overlapping of said second orders on said detector;

reading simultaneously by said detector said zero

diffractive order, said first diffractive orders and said second diffractive orders, differentiating by said detector utilizing any of their individual said measuring properties.

43. (Original) The method of claim 26,

striking said photodetector with said light further comprising;

said zero diffractive order with a first set of said measuring properties comprising a first intensity, a first frequency of intensity modulation, and a first phase; and

said first diffractive orders with a second set of said measuring properties comprising a second intensity, a second frequency of intensity modulation, a second phase;

overlapping of said first orders with said zero order on said detector;

reading simultaneously by said detector said zero and said first diffractive orders and differentiating by said detector utilizing any of their individual said measuring properties.

44. (Original) The method of claim 26,

striking said photodetector with said light further comprising;

said zero diffractive order with a first set of said measuring properties comprising a first intensity, a first frequency of intensity modulation, and a first phase; and

said first diffractive orders with a second set of said measuring properties comprising a second intensity, a second frequency of intensity modulation, a second phase; and

said second diffractive orders with a third set of said

measuring properties comprising a third intensity, a third frequency of modulation and a third phase;

overlapping of said first orders with said zero order on said detector, and overlapping of said second orders on said detector;

reading simultaneously by said detector said zero diffractive order, said first diffractive orders and said second diffractive orders, differentiating by said detector utilizing any of their individual said measuring properties.

45. (Currently Amended) A method for detecting and interpreting light signals striking a detector of an optical pickup apparatus, comprising the steps of:

causing said light signal to strike said detector in a manner that comprises at least two individual diffractive orders_ diffracted by an electronically reconfigurable diffraction grating, whereby each said individual diffractive order is possessing individual measuring properties comprising an intensity, an intensity modulation and a phase;

interpreting said light signal striking said detector by reading said individual measuring properties of each said individual diffractive order and extracting content or tracking information.